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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/653,196	08/31/2000	Charles R. Cash	8320.10	4698

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EXAMINER	
STEVENS, THOMAS H	

ART UNIT	PAPER NUMBER
2123	7

DATE MAILED: 12/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/653,196	CASH ET AL.	
	Examiner	Art Unit	
	Thomas H. Stevens	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on ~~31 August 2000~~ 8/6/2001.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) 1-26 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-26 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 08/31/00 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Title

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: Simulation of real-time consumer checkout transaction process for continuous evaluation and optimization of business practices.

Drawings

2. The drawing filed on August 31, 2000 are objected to by the draftsperson under CFR 1.84 or 1.152 for the reasons indicated below:

- Figures 1, 10,12,14,16, and 23: The top portion of the margins is not acceptable; acceptable margins (top) are 2.5 cm.
- Figures 4-25: Lines, numbers & letters not uniformly thick and well defined, clean, durable and black (poor line quality).

Corrected drawings are required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

4. Claims 1-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-26: All claims fail to detail limitations for evaluating the input parameters and running the simulation model; nor does it detail the limitation of the output results. Additionally, the first sentence does not disclose the necessary steps to quantitatively and evaluate alternatives regarding check-operations.

Claim 4, for example: "fast-track customer" –vague

Claim 5, for example: "running step", unlimited arrival mode and a limited arrival mode"–vague.

Claim 6, for example: "intervention" –intervention of what?

Claims 8, 14 and 24, for example: "super-helpers"-vague.

Claim 9, for example: "a model parameters category"-vague.

Claim 11, for example: "belt size" –vague.

Claim 17, for example: "and which resources are available for bagging" –indefinite.

Claim 18, for example: "replications, a stream number"-vague.

Claim 20, for example: "range and value"- vague and indefinite.

Claim 22, for example: "running step and step outputting step" confusing and vague.

Claim 23, for example: "each type of resource"- vague.

Claim 24, for example: "all resources" –vague and indefinite; "regular lanes"-indefinite.

Claim 25, for example: "all measures", "lane"-both terms indefinite.

Claim 26, for example : "performance measurement"-vague and indefinite.

Appendix

5. This application contains a computer program listing of more than three hundred (300) lines. In accordance with 37 CFR 1.96(c), a computer program listing contained on more than three hundred (300) lines, must be submitted as a computer program

listing appendix on compact disc conforming to the standards set forth in 37 CFR 1.96(c)(2) and must be appropriately referenced in the specification (see 37 CFR 1.77(b)(4)). Accordingly, applicant is required to cancel the current computer program listing, file a computer program listing appendix on compact disc in compliance with 37 CFR 1.96(c), and insert an appropriate reference to the newly added computer program listing appendix on compact disc at the beginning of the specification.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 1-26 are rejected under 35 U.S.C. 101 because the claimed invention is directed to a mathematical algorithm. The examiner respectfully submits that the applicants have not claimed a practical application. An invention which is eligible for patenting under 35 U.S.C. § 101 is in the "useful arts" when it is a machine, manufacture, process or composition of matter, which produces a concrete, tangible, and useful result. The fundamental test for patent eligibility is thus to determine whether the claimed invention produces a "useful, concrete and tangible result."

The examiner respectfully submits, under current PTO practice, that the claimed invention does not recite a tangible or concrete result. The claims are not tangible because they appear to merely recite some unknown simulation, which is somehow related to check out operations. For example, claim 1 does not even recite obtaining results and evaluating the results as recited in the claim preamble. Furthermore, there's no post-solution activity.

Claim Interpretation

8. Office personnel are to give claims their **"broadest reasonable interpretation"** in light of the supporting disclosure. *In re Morris,* 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater,* 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551(CCPA 1969). See *also *In re Zletz,* 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322(Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow .... The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed .... An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative. **The examiner interprets the following terms: "super-helpers" as additional retail cashiers; and data input dictionary as a database.**

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Frey et al (US patent 5,557,513).

Frey teaches a computer system and method for forecasting the traffic at checkout lanes in mass merchandising stores, department stores, grocery stores, and

other applications to give management sufficient time to properly staff the checkout lanes to maximize labor efficiency and customer satisfaction (column 1, lines 1-6). The system combines real-time data with pre-gathered statistical data about the population that shops in a particular type of store and data, which characterizes the checkout lane throughput capacity for the store to predict checkout lane traffic and staffing requirements. The system of the present invention is adapted for use in store having express and non-express checkout lanes (Abstract: lines 6-12).

The checkout lane alert system disclosed is a live, computer-based, in-store system that integrates real-time shopper traffic data with computerized statistical analysis in order to generate accurate short-term forecasts of shopper traffic at the checkout lanes of the store. The system uses up to the minute traffic data to create its forecast and allows a retailer to track the momentary surges in lane traffic and meet these with the proper staffing (column 2, lines 1-8).

The checkout lane alert system predicts checkout lane traffic in stores having both express checkout lanes and non-express checkout lanes. The preferred embodiment uses a modern supermarket as an example. The system of the present invention is indicated generally as 10' in FIG. 10. The system 10' comprises a shopper traffic recognition system 12', a computer 14' and a computer file 20' arranged similarly as in the parent. The software of the present invention performs random assignment of shopping times to individual shoppers (shown at 60 in FIG. 3C) in two steps, as shown in FIG. 13. First, at 60A, the software assigns to each shopper a number of items that each shopper will purchase. The number of items each shopper will purchase is a

random variable selected based on a frequency distribution curve of items purchased by each shopper. This frequency distribution curve is typically a bell-shaped curve, representing for example that the probability of a shopper purchasing 10 items is higher than the probability of a shopper purchasing five items or 18 items (column 8, lines 53-67).

The computer that is connected with the recognition system runs the software for the invention. This software allows the computer to retrieve the shopper entry and exit time data from the recognition system for use in its statistical analysis. The software combines this real-time data with pregathered statistical data about the population that shops in a particular type of store, and data, which characterizes the checkout lane throughput capability for a store. Each minute the software performs many simulations which combine these factors in different ways in order to forecast the shopper traffic at the checkout lanes for that minute and minutes that follow. The computer screen graphically displays the forecast, and the system updates the screen display with results of the simulations and alerts store personnel when lane traffic will increase or decrease to a point where a new checkout lane staffing level is needed (column 2, 3rd paragraph). The recognition system determines the number of shopper units that enter the store, a "shopper unit" being defined as a person expected to make purchases in the store. The recognition system comprises one or more sensors that may be mounted above the store entry and exit doorways. When a person or object passes beneath these sensors, the system measures the height, speed, and length of the person or object and generates signals representing a time-dependent height profile of the person or object

as the person or object moves past the sensor. These signals are transmitted to a signal processor, and from there to a central processing unit which processes the signals and generates data representing the number of persons or objects in pre-selected categories. The system also determines the direction of movement of the person or object (in or out of the store). From a comparison with selected criteria, the system determines whether a particular person entering the store is a potential buyer as opposed, for example, to a small child who is not likely to buy or an object such as a shopping cart (column 4, lines 38-62).

The computer runs the software for the checkout lane alert system and allows the computer to retrieve the shopper entry time data from the recognition system for use in its statistical analysis. Furthermore, the software combines the real-time data with pre-gathered statistical data about the population that shops in a particular type of store and data which characterizes the checkout lane throughput capability for the store to predict checkout lane staffing requirements (column 5, lines 1-9).

The number of simulations is disclosed as preferably 200, although a fewer or greater number may be used. It has been found that under most conditions those 200 simulations are sufficient to provide reliable data for updating the display. So during each current minute the lane alert system operates in real-time to update shopper entry information from the recognition system and compute 200 simulations for updating the display (column 4, lines 48-52).

The system further comprises of an optional communication link to a store paging system or other alert mechanism to alert store management of the need to change lane

staffing; and an optional communication link to the store point-of-sale (POS) equipment for a real-time update of store parameters, which may be used by the checkout lane software. These parameters may include shopping time, checkout processing time, and conversion rate, which are stored in a computer file, resident in the computer (column 5, lines 9-18).

In accordance with the program, the shopper traffic data from the recognition system for a period of 30 seconds is retrieved through the communication link. The lane alert system then creates and updates a checkout lane traffic forecast for the current minute through the next 20 minutes. This is described in more detail with reference to the flow diagrams of FIGS. 3-5. From data representing the updated forecast, an updated graphic display of the traffic forecast is generated along with alert messages for lane staffing requirements. This processing is repeated during each minute in real-time (column 5, lines 28-38).

As shown in FIG. 3C, if the shopper is designated as a buyer, the shopper is assigned an arbitrary value of shopping time at 60 minutes from a bell curve, such as that of FIG. 6, from which the shopper's minute arrival time at the checkout lane is calculated. The minute arrival time is the minute index (the time the shopper entered the store as detected by the recognition system) plus the shopping time randomly assigned from the bell curve. This process is repeated for each successive shopper that entered the store during the first minute of the past 60 minutes, and then is further repeated for each successive shopper that entered the store during each successive minute during the past 60 minutes. Finally, the process is then repeated 200 more times, each time

beginning with the first shopper entry of the first minute and ending with the last shopper entry of the last minute until all 200 additional cycles are completed. With each cycle each shopper entry is designated as a "buyer" or "no-buyer" based on the conversion rate, and each is randomly assigned a shopping time from the bell curve. As the simulations are computed, the number of buyers that arrive at the checkout lanes during each minute from minus 20 minutes to the present minute and from the present minute to plus 20 minutes is incremented or totaled at 70, and the totals for each minute divided by the maximum simulations (in this embodiment 200 simulations), to arrive at the total number of buyers arriving at the checkout lanes for each minute from minus 20 to plus 20 minutes (FIG. 4). After it has completed all simulations, the system clears the graphic display and sets up a new display, which graphs the results of the simulations from minus 20 to plus 20 minutes. A typical such graph is shown in FIG. 8. So for each of the 40 minutes the system computes based on the simulations the number of buyers to arrive during each minute interval and plots the information on the graphic display (column 6, lines 43-67 and column 7, lines 1-9).

During each update, the system goes back 60 minutes, and for each minute of the past 60 minutes the recognition system 12' has stored information on the shoppers who entered the store during that minute. For each shopper entering the store during each minute of the past 60 minutes the system pseudo-randomly assigns the number of items that each shopper will purchase, determines a shopping time, determines whether the shopper is express eligible or not, and adds the shopper to an appropriate checkout lane at the shopper's checkout lane "arrival" time. The system repeats this simulation a

large number of times (200 in this preferred embodiment) every minute. During the many repetitions of the simulations, shoppers will be assigned different random combinations of items purchased, corresponding shopping times, etc. The final forecast is the average of these simulations. In other words, as the simulations are computed the number of shoppers who arrive at express and non-express checkout lanes during each minute from minus 20 minutes to plus 20 minutes (relative to the present minute) is incremented or totaled. The total for each minute is divided by the number of simulations (200 in this embodiment) to arrive at the checkout lane traffic for both express and non-express checkout lanes from minus 20 minutes to plus 20 minutes. After all simulations are complete, the system clears the existing graphic display and graphs a current display from minus 20 to plus 20 minutes (column 10, lines 54-67 and column 11, lines1-12).

In addition to producing a graphic display of predicted lane arrivals over a selected period, the system disclosed in the parent also computes the need for staffing changes at the checkout lanes in response to the predicted checkout lane traffic and other criteria. The display screen displays alert messages telling the operator whether staffing changes are needed. In predicting staffing changes several factors come into play. One such factor relates to the weight to be given the lane traffic data for each period of time for the time interval over which the lane traffic is displayed. It has been found that greater weight should be given to the lane traffic closer to the present time than to the lane traffic expected at times further in the future. Therefore, for purposes of determining whether to open or close checkout lanes, it has been found desirable to

weight the averages in favor of those near the current time. Therefore, the invention disclosed in the parent weights the average lane traffic T1' for minus 5 to plus 4 minutes at 55%, the average traffic T2' for plus 5 to plus 9 minutes is weighted 30%, and the average traffic T3' for plus 10 to plus 14 minutes is weighted 15%. The sum of these produces a weighted average of lane traffic from minus 5 to plus 14 minutes. The system then predicts staffing requirements from a look-up table of staffing required for this weighted average traffic (column 7, lines 20-42).

Although the comparison with the look-up table indicates a staffing change, it has been found desirable to make such a change only if the condition dictating the change has existed for some period of time. This prevents excessive staffing changes resulting from overreaction to temporary lane traffic of short duration. Thus, in a second embodiment of the invention, the staff requirement for the present minute is compared with the staff requirement for the prior two minutes. The system generates an alert message on the screen telling the operator to increase lane staffing as indicated by the present minute only if that staffing is greater than that of the prior two minutes. The system displays a message on the screen telling the operator to decrease the lane staffing only if the system indicates a staff level for this minute and the staff levels for the last eight consecutive minutes are less than the staff presently deployed. If these comparisons indicate that no staffing changes are required, the system displays a message to hold the present staffing (column 7, lines 43-61).

The lookup table for determining staff requirements as disclosed in the parent may be created from data generated from the off-line processing shown by the flow

diagrams of FIG. 9. The staffing requirements for a particular store depend on the traffic lane forecast and certain "optimal" conditions for that store. These conditions include: the average time a buyer will wait in line at the checkout; the maximum wait a buyer will experience at the checkout; the maximum line length (number of people); percent cashiers' idle time. For example, a particular store may establish the following "optimal" parameters: on average a buyer should wait in line less than 30 seconds; the maximum wait in line should be less than five minutes; the maximum line length should be no more than four people; the percent idle time for the cashiers should be between 10-15%. These "optimal" conditions will vary depending on the store, time of day and other conditions (column 7, lines 65-67; and column 8, lines 1-14).

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom Stevens whose telephone number is (703) 305-0365, Monday-Friday (8:00 am- 4:30 pm) or contact Supervisor Mr. Kevin Teska at (703) 305-9704.

Any inquires of general nature or relating to the status of this application should be directed to the Group receptionist whose phone number is (703) 305-3900.

December 19, 2003

THS
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